

**FLORENCE COPPER INC.**

1575 W. Hunt Highway, Florence, Arizona 85132 USA

florencecopper.com

December 3, 2021

Ms. Nancy Rumrill
Water Division
U.S. EPA, Region IX (WTR-4-2)
75 Hawthorne Street
San Francisco, California 94105

Re: Comments Regarding *Draft Area Permit, Class III In-Situ Production of Copper, Permit No. R9UIC-AZ3-FY19-1*, on behalf of Florence Copper Project, Florence, Arizona

Dear Ms. Rumrill:

Florence Copper Inc. (Florence Copper) appreciates the opportunity to review and provide comment on the *Draft Area Permit, Class III In-Situ Production of Copper, Permit No. R9UIC-AZ3-FY19-1* (Draft UIC Permit) conveyed to Florence Copper by email on November 19, 2021.

Florence Copper has proposed minor text changes to clarify permit language and to enhance consistency. The proposed text changes are detailed in the attached Table 1.

Florence Copper has noted several minor inconsistencies in Table 14 of the Draft UIC Permit. The intent of these Tables was to synchronize alert level (AL) and aquifer quality limit (AQL) values between the APP and UIC permit. Several of the AL and AQL values listed in the Draft UIC Permit are different than those listed in the final version of APP No. P-101704. The proposed AL and AQL value corrections and the values listed in the APP are listed in Table 2. A revised version of Table 14 is attached which includes the referenced AL/AQL changes detailed in Table 2.

Florence Copper appreciates the effort that you and your staff have put into preparation of the Draft UIC Permit.

Please contact me at 520-316-3710 if you require any additional information.

Sincerely,
Florence Copper Inc.



Brent Berg
General Manager

Attachments:

Table 1 – Proposed Text Changes to UIC Draft Class III for In-Situ Production of Copper,
Permit No. R9UIC-AZ3-FY19-1, Dated November 19, 2021

Table 2 – Proposed AL Corrections to UIC Draft Class III In-Situ Production of Copper, Permit
No. R9UIC-AZ3-FY19-1, Dated November 19, 2021

Table 14 – Annual Groundwater Monitoring

cc: Maribeth Greenslade, Arizona Department of Environmental Quality

ATTACHMENTS

TABLE 1
**PROPOSED TEXT CHANGES TO UIC DRAFT CLASS III FOR IN-SITU PRODUCTION
 OF COPPER, PERMIT NO. R9UIC-AZ3-FY19-1, DATED NOVEMBER 19, 2021**
 FLORENCE COPPER INC.
 FLORENCE, ARIZONA

Comment No.	Permit Section	Page Reference	Notes	Proposed Change
1	Part II.C.10.a Part II.E.3.a.ii.(C) Part II.E.3.b.i	Pages 19, 24, and 25	<p>Clarify that changing from injection to recovery or vice versa is not a workover requiring MIT.</p> <p>Identifies a final well construction report for each new or converted Project well. All Class III wells require a final well construction report. This would preclude the need to submit another report for a "converted" well unless it were to meet the requirements of a proposed change or work-over in Part II.C.11. Part II.E.3 also requires that all Project wells shall maintain mechanical integrity at all times.</p> <p>Converting a Class III well from recovery to injection does not constitute a work-over based on the definition of proposed change or work-over provided in Part II.C.11. The definition of work-over in Part II.C.11 reads as follows:</p> <p><i>"A well work-over is any physical alteration or addition to an existing well that results in a change in the composition, diameter, perforations, screen depths, tubing, or depth of the well casing or a change in the cement in the outer annulus."</i></p> <p>Changing a well from injection to recovery or vice versa may be accomplished by removal of the pump and replacement with straight tubing. The change may also be accomplished by injecting through the pump, without removing any equipment from the well. In either case, the change-over activity is less invasive than the MIT test and does not change the composition, diameter, perforations, screen depths, tubing material, or depth of the well casing or change in the cement in the outer annulus.</p>	<p>Part II.C.10.a The Permittee must submit a final well construction report for each new or converted worked over Project well, including logging and other results, with a schematic diagram and detailed description of construction, including driller's log, materials used (e.g., tubing tally, cement, and other volumes), to EPA within sixty (60) days after completion of all ISCR wells for the operational unit(s) in a resource block and monitoring wells required to be installed. Refer to EPA Form 7520-18 listed in Appendix I. Construction details, downhole equipment, depths to key formation tops and the USDW base, and screened interval depths will be included in the well completion report and schematics of all Project wells.</p> <p>Part II.E.3.a.ii.(C) After installing and cementing casing, conversion of a non-injection well to injection operations, work over, conducting a cement squeeze operation, or any well cement repair, the Permittee shall provide cementing records and cement evaluation logs that demonstrate isolation of the injection interval and other formations from the USDWs. Cementing records and logs shall demonstrate complete filling of the annulus between the borehole wall and well casing with cement.</p> <p>Part II.E.3.b.i A demonstration of internal mechanical integrity shall be made within thirty (30) days subsequent to the installation of a new ISCR or monitoring well. All FCP wells will be pressure tested for mechanical integrity in accordance with paragraph 3.a.i.A of this section. Injection wells shall be tested no less frequently than once every five years while active and every two (2) years while inactive unless abandonment or closure occurs prior to that time. Internal mechanical integrity of a well shall also be demonstrated within thirty (30) days after a work-over is conducted, the construction of the well is modified, a conversion of a well to injection or recovery service occurs, or when loss of mechanical integrity becomes evident during operation.</p>
2	Part II.E.6.c	Page 27	Include the use of treated water in addition to fresh water for rinsing.	<p>Part II.E.6.c Fresh water or treated water may be injected to assess the hydraulics of the injection and recovery patterns in the ISCR wellfield to assess the performance of related surface facilities during rinsing operations, and for maintenance of hydraulic control in the buffer zone between leaching and rinsing blocks.</p>
3	Part II.E.6.e	Page 27	<p>Florence Copper will use filtration on the front end of the reverse osmosis water treatment process. The type of filtration may change over time or may be changed to improve treatment efficiency. Florence Copper proposes deleting the word "multimedia."</p>	<p>Part II.E.6.e During closure of operations units in resource blocks, fresh groundwater or treated water may be injected to restore the zone to federal drinking water standards or pre-operational background concentrations. The Permittee may also adjust the pH with sodium bicarbonate or other non-hazardous neutralizing agents to aid in the precipitation of soluble metals.</p> <p>The Permittee may also use treated water during formation rinsing which will supplement fresh groundwater to reduce overall water consumption and to expedite formation rinsing. The water treatment system will utilize multimedia filtration, reverse osmosis (RO), and pH adjustment to treat solution recovered from the wellfield and use the resulting treated water to supplement the rinsing injectate. The treated water quality will be equivalent to or better than formation water and of a quality sufficient to achieve the closure criteria of Section II.I of this Permit.</p> <p>The Permittee will conduct monthly sampling and analysis of the treated water for water quality parameters in Table 2, Section F of this Permit to document that the quality meets the requirements described above. The Permittee shall provide these analytical results in the Quarterly report, per Section II.G.2 of this Permit.</p>

TABLE 2

**PROPOSED AL CORRECTIONS TO UIC DRAFT CLASS III IN-SITU
PRODUCTION OF COPPER, PERMIT NO. R9UIC-AZ3-FY19-1, DATED NOVEMBER 19, 2021**
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter	M4-O		M6-GU		M7-GL	
	APP AL	Draft UIC AL	APP AL	Draft UIC AL	APP AL	Draft UIC AL
Mercury (mg/L)	0.0016	0.0011	0.0016	0.0011	0.0016	0.0011

Parameter	M3-GL		M15-GU	
	APP AL	Draft UIC AL	APP AL	Draft UIC AL
Gross Alpha (pCi/L)	15	1	15	1

Parameter	M54-O	
	APP AL	Draft UIC AL
Manganese	0.52	0.22

Parameter	M54-LBF		M54-O	
	APP AQL	Draft UIC AQL	APP AQL	Draft UIC AQL
Adjusted Gross Alpha (pCi/L)	15	26.5	15	26.5

Correct AL/AQL value listed in APP No. P-101704

Incorrect AL/AQL value listed Draft UIC Permit

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter ¹	M1-GL		M2-GU		M3-GL		M4-O		M6-GU		M7-GL		M8-O		M14-GL		M15-GU	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)
pH (lab)	Monitor ²	Monitor	Monitor	Monitor														
Bicarbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Calcium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Carbonate	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Chloride	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Nitrate as nitrogen ³	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Potassium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Sodium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Cation/anion balance	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Aluminum	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	Monitor	0.71	NE	0.71	NE	0.71	NE	0.71
Antimony	0.006	0.005	0.016	Monitor	0.006	0.005	0.006	0.006	0.005	0.006	0.005	0.006	0.005	0.016	NE	0.016	NE	0.016
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.0053	Monitor	0.0053	Monitor	0.0053	NE	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	Monitor	0.040	Monitor	0.005	Monitor	0.040	NE	0.005	0.004	0.040	NE	0.005	0.004	0.005	0.004	0.04	NE
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE ⁴	0.005	NE	0.005														
Copper	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.51	NE	0.8	NE	0.8	NE	0.8
Iron	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2	NE	2.2
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22	NE	0.22
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.13	NE	0.13	NE	0.13	NE	0.10	0.08	0.10	0.08	0.13	NE	0.1	0.08	0.13	NE	0.13	NE
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.027	0.05	0.027	0.05	0.027	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Zinc	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	2.5	NE	4	NE	4	NE	4
Gross Alpha (pCi/L) ⁵	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	Monitor	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L) ⁶	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total Uranium	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

¹ Metals must be analyzed as dissolved metals.

² Monitor = Monitoring required, but no AQL or AL will be established in the permit.

³ Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

⁴ NE = Not Established

⁵ If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radon 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁶ Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter ¹	M16-GU(R)		M17-GL		M18-GU		M19-LBF		M20-O(R)		M21-UBF		M22-O		M23-UBF		M24-O	
	AQL (mg/L)	AL (mg/L)																
pH (lab)	Monitor	Monitor																
Bicarbonate	Monitor	Monitor																
Calcium	Monitor	Monitor																
Carbonate	Monitor	Monitor																
Chloride	Monitor	Monitor																
Nitrate as nitrogen ³	Monitor	Monitor																
Potassium	Monitor	Monitor																
Sodium	Monitor	Monitor																
Cation/anion balance	Monitor	Monitor																
Aluminum	NE	0.71																
Antimony	0.006	0.005	0.016	NE	0.016	NE	0.006	0.005	0.006	0.005	0.016	NE	0.016	NE	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.04	NE	0.005	0.004	0.04	NE	0.005	0.004	0.04	NE	0.04	NE	0.04	NE	0.04	NE	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005																
Copper	NE	0.8																
Iron	NE	2.2																
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22																
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.002	0.0016	0.024	NE	0.002	0.0016	0.024	NE	0.002	0.0016								
Zinc	NE	4																
Gross Alpha (pCi/L) ⁵	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L) ⁶	Monitor	Monitor																
Total Uranium	Monitor	Monitor																
Total petroleum hydrocarbons- diesel	Monitor	Monitor																
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

¹ Metals must be analyzed as dissolved metals.

² Monitor = Monitoring required, but no AQL or AL will be established in the permit.

³ Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

⁴ NE = Not Established

⁵ If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radon 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁶ Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter ¹	M25-UBF		M26-O		M27-LBF		M28-LBF		M29-UBF		M30-O		M31-LBF		O19-GL		O49-GL(R)	
	AQL (mg/L)	AL (mg/L)																
pH (lab)	Monitor	Monitor																
Bicarbonate	Monitor	Monitor																
Calcium	Monitor	Monitor																
Carbonate	Monitor	Monitor																
Chloride	Monitor	Monitor																
Nitrate as nitrogen ³	Monitor	Monitor																
Potassium	Monitor	Monitor																
Sodium	Monitor	Monitor																
Cation/anion balance	Monitor	Monitor																
Aluminum	NE	0.71																
Antimony	0.006	0.005	0.016	NE	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.005
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6
Beryllium	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032	0.004	0.0032
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08
Cobalt	NE	0.005																
Copper	NE	0.8																
Iron	NE	2.2																
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Manganese	NE	0.22																
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016
Nickel	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04
Thallium	0.024	NE	0.002	0.0016	0.024	NE												
Zinc	NE	4																
Gross Alpha	NE	15																
Adjusted Gross Alpha (pCi/L) ⁵	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12	15	12
Radium 226 + 228 (pCi/L)	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4	5	4
Total Uranium Isotopes (pCi/L) ⁶	Monitor	Monitor																
Total Uranium	Monitor	Monitor																
Total petroleum hydrocarbons- diesel	Monitor	Monitor																
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

¹ Metals must be analyzed as dissolved metals.

² Monitor = Monitoring required, but no AQL or AL will be established in the permit.

³ Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

⁴ NE = Not Established

⁵ If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radon 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁶ Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.

TABLE 14
ANNUAL GROUNDWATER MONITORING
FLORENCE COPPER INC.
FLORENCE, ARIZONA

Parameter ¹	P19-1-O		P49-O		M52-UBF		M54-LBF		M54-O		M33-UBF (replacement)	
	AQL (mg/L)	AL (mg/L)	AQL (mg/L)	AL (mg/L)								
pH (lab)	Monitor	Monitor	Monitor	Monitor								
Bicarbonate	Monitor	Monitor	Monitor	Monitor								
Calcium	Monitor	Monitor	Monitor	Monitor								
Carbonate	Monitor	Monitor	Monitor	Monitor								
Chloride	Monitor	Monitor	Monitor	Monitor								
Nitrate as nitrogen ³	Monitor	Monitor	Monitor	Monitor								
Potassium	Monitor	Monitor	Monitor	Monitor								
Sodium	Monitor	Monitor	Monitor	Monitor								
Cation/anion balance	Monitor	Monitor	Monitor	Monitor								
Aluminum	NE	0.71	NE	0.71	NE	0.16	NE	0.16	NE	0.16	Reserved	Reserved
Antimony	0.006	0.005	0.006	0.005	0.006	0.0048	0.006	0.0048	0.006	0.0048	Reserved	Reserved
Arsenic	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	0.05	0.026	Reserved	Reserved
Barium	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	2.0	1.6	Reserved	Reserved
Beryllium	0.0053	NE	0.0053	NE	0.004	0.0032	0.004	0.0032	0.004	0.0032	Reserved	Reserved
Cadmium	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	Reserved	Reserved
Chromium (total)	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	0.10	0.08	Reserved	Reserved
Cobalt	NE	0.005	NE	0.005	NE	0.002	NE	0.002	NE	0.002	Reserved	Reserved
Copper	NE	0.8	Reserved	Reserved								
Iron	NE	2.2	NE	2.2	NE	1.4	NE	1.4	NE	1.4	Reserved	Reserved
Lead	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	Reserved	Reserved
Manganese	NE	0.22	NE	0.22	NE	0.52	NE	0.52	NE	0.52	Reserved	Reserved
Mercury	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Nickel	0.13	NE	0.1	0.08	0.1	0.08	0.1	0.08	0.1	0.08	Reserved	Reserved
Selenium	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	0.05	0.04	Reserved	Reserved
Thallium	0.024	NE	0.002	0.0016	0.002	0.0016	0.002	0.0016	0.002	0.0016	Reserved	Reserved
Zinc	NE	4	Reserved	Reserved								
Gross Alpha	NE	15	Reserved	Reserved								
Adjusted Gross Alpha (pCi/L) ⁵	15	12	15	12	15	12	15	NE	15	NE	Reserved	Reserved
Radium 226 + 228 (pCi/L)	5	4	5	4	17.2	NE	17.2	NE	17.2	NE	Reserved	Reserved
Total Uranium Isotopes (pCi/L) ⁶	Monitor	Monitor	Monitor	Monitor								
Total Uranium	Monitor	Monitor	Monitor	Monitor								
Total petroleum hydrocarbons- diesel	Monitor	Monitor	Monitor	Monitor	Monitor	NE	Monitor	Monitor	Monitor	Monitor	Monitor	Monitor
Benzene	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.004
Ethylbenzene	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56	0.7	0.56
Toluene	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8
Total Xylene	10	8	10	8	10	8	10	8	10	8	10	8

Notes:

¹ Metals must be analyzed as dissolved metals.

² Monitor = Monitoring required, but no AQL or AL will be established in the permit.

³ Nitrate will be used only for calculation of cation/anion balance because of regional nitrate pollution and none used in processes.

⁴ NE = Not Established

⁵ If the gross alpha particle activity is greater than the AL or AQL, then calculate the adjusted gross alpha particle activity. The adjusted gross alpha particle activity is the gross alpha particle activity, including radium 226, and any other alpha emitters, if present in the water sample, minus radon and total uranium (the sum of uranium 238, uranium 235 and uranium 234 isotopes). The gross alpha analytical procedure (evaporation technique: EPA Method 900.0) drives off radon gas in the water samples. Therefore, the Adjusted Gross Alpha should be calculated using the following formula: (Laboratory Reported Gross Alpha MINUS Sum of the Uranium Isotopes).

⁶ Uranium Isotope activity results must be used for calculating Adjusted Gross Alpha.